GENLOCK

Rendale

A8802 USER MANUAL

A8802 Genlock and Composite Video Overlay Controller for the Amiga Computer.

Genlock is a term used to describe the ability of one video device to track and lock to another video device and is derived from the terms GENeral and LOCKing.

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This product is designed for direct connection to the following machines:-

A500, A1000, A2000, B2000

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1.0 Genlock Introduction

Thank you for choosing the Rendale A8802 Genlock. This Genlock and Video Controller was designed to work with the Amiga A500, A1000, A2000 and B2000 computers.

Genlock lets you combine the Amiga's outstanding video graphics with almost any video source, such as a laser disk, video camera, VCR, another computer, an off air signal or, in a professional environment, colour black.

Using these external sources it is possible to create your own video overlays for presentations, advertisements and training videos. You can even title your own home produced videos.

With third party control software it is also possible to produce interactive video programs using Laser Disks or other Controllable Video Sources.

Applications.

Almost all applications for video graphics overlay can be achieved with this system, for example:-

1. Video Titling
2. Video Graphics Overlays/Wipes
3. Interactive Video Terminals
4. Low Cost Simulators
5. Point of Sale Terminals
6. Video Data Base Applications
7. Training Systems
8. Video Productions
9. Security Systems
10. Industrial Control Systems
11. Advertising Systems
12. Information Terminals

1.1 How Genlock Works

When supplied with an input video signal, the Genlock splits the signal into its component parts. It takes the video timing signals for Line, Frame and Colour Burst and uses these to 'lock' the Amiga onto whichever External Video source is being used. This ensures that both the External Video Signal and the Amiga Display Signal are writing the same colour in the same place at the same time to the display screen. Once the two video displays are locked together, a very high speed video switch alternates between the external video signal and the Amiga Graphics display. The result is a mixture of the two displays.

1.2 Genlock Functions

The A8802 is a device that provides three functions to form a video controller.

These functions are:-

a. Genlocking
b. Graphics Encoding
c. Video Overlay Switching

Genlocking is achieved by controlling the Amiga's system clock and graphics display chips, so that the Amiga's video signals are time coincident with the external source of video.

The retimed Amiga video signals are available in RGBa format and are also coded within the unit to provide a composite video signal.

The encoder section takes the Amiga's RGBa signals and provides a coded composite video signal. This coded signal being locked to the incoming video signal.

Circuits, controlled by the mode selection logic, enable high speed video switching between the external composite video signal and the Amiga coded video signal. The new, combined, video signal is a mixture of original video overlaid with Amiga graphics.

The Rendale Genlock video switch can be controlled in the following way:-

a. Genlocked Amiga display.

b. Bypass (External video only).

c. Background Mode - (Default mode).
In this mode the Amiga background colour is replaced with the external video signal.

d. Foreground Mode.
In this mode black graphics show the video signal. Any colour that has RGBI as 0000 becomes transparent, this can include the background as well.

2.0 Getting Started

2.1 Unpacking your Genlock

Please unpack the unit carefully and do not throw away any of the packaging.

Your pack should contain:-

One A8802.

The A8802 has a flat ribbon cable attached to one end.
Please note that due to supply difficulties the 23 way connector on this cable is a 25 way connector which has been cut down to 23 ways. This is normal and it is not damaged.

One User Manual.

One Genlock Software Control Disk.

One 23 way 'D' connector.

Check the package carefully for any damage or any missing items. Should you have any complaint these should be reported to your supplier as soon as possible.

2.2 Connecting the unit

STOP!

BEFORE PROCEEDING ENSURE THAT THE AMIGA SYSTEM IS SWITCHED OFF AND DISCONNECTED FROM THE MAINS SUPPLY.

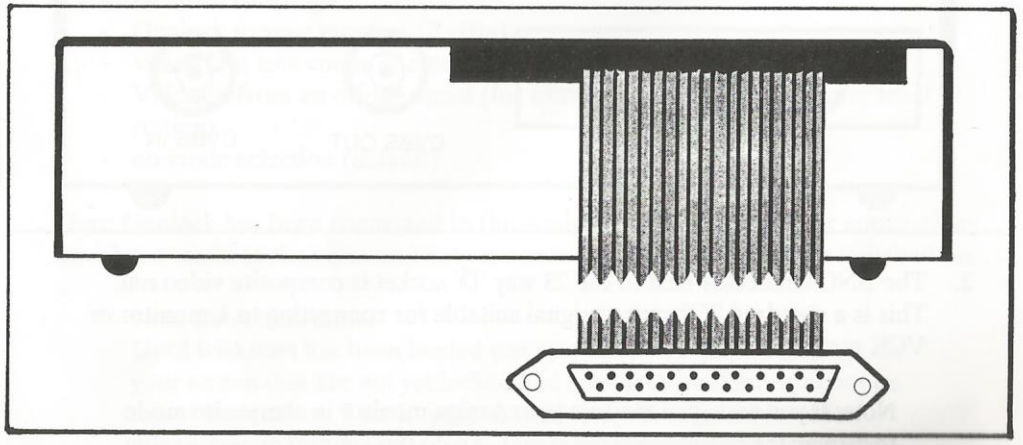
ALWAYS ENSURE THAT THE AMIGA IS SWITCHED OFF BEFORE CONNECTING OR DISCONNECTING THE RIBBON CABLE FROM THE A8802 TO THE AMIGA COMPUTER.

The Genlock is designed to sit behind your computer. Before you begin connecting your Genlock, be sure that you have sufficient space behind your Amiga to place the Genlock.

Genlock has a total of four possible connection points.
The first of these is the Amiga Video Port-to-Genlock cable. This is a flat cable and has a 23 pin connector which needs to be connected to the Amiga RGBa Port.

Amiga Video Port cable

With the Amiga and all peripheral devices off, you will need to gain access to the rear of the Amiga. Locate the Amiga RGBa Video Port and connect the Genlock 23 way connector to this socket.



GENLOCK 23 WAY CONNECTOR

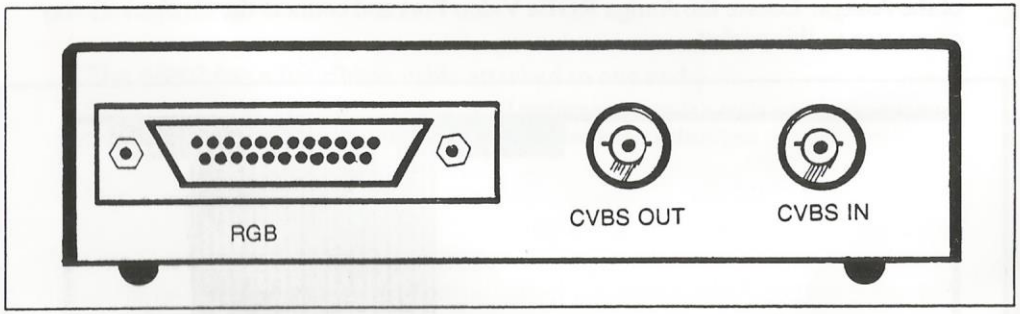
Your RGBa monitor cable may already be connected to this port, disconnect the monitor cable from the Amiga video port and connect your Genlock in it's place. Your RGBa monitor can be reconnected to the system as suggested later in the installation procedures.

The Genlock has three sockets at the end which are yet to be connected, these sockets are the input/output connectors.

Input/output connectors

1. The 23 way 'D' socket provides Amiga RGBa video and the mode control lines.
   This socket can be used for:-
   a. displaying Amiga video by fitting the original Amiga Monitor lead.
   or
   b. providing a connection point for an external coder or RGBa mixing desk etc.
   c. a connection point for controlling the Genlock Mode. (see Genlock Modes for a full description of the operating modes).

   A 23 way plug is provided to make suitable connections for any combination of these functions.



2. The BNC connector next to the 23 way 'D' socket is composite video out. This is a standard 75R output signal suitable for connecting to a monitor or VCR etc.

   Note: If you wish, you may use your Amiga monitor in composite mode to display the mixed video out signal. To do this simply connect a cable from Video Out to the Video In at the rear of the Amiga monitor. A

mode switch on the front of your Amiga monitor will enable you to switch from RGB to COMP. With both cables connected you can switch between the displays as required.

3. The remaining BNC connector is the Video In connection. This socket is used to supply Genlock with sync and external video information. It can be supplied with either a standard 75R video signal from VCR, Camera, Laser Disk etc. or with black and burst.

   Two points should be noted when using Genlock.
   The first is that if this socket is not supplied with a suitable input then Genlock free runs. When the unit is in free run mode, the output is not suitable for recording. To record your Amiga output a suitable composite or sync signal should be pro vided and Amiga only mode selected for correct results (see mode selection section). In free run mode the output is only suitable for displaying on monitors. The second point is that if you provide a black and white signal as an input to Genlock, then Genlock will lock to this and provide an overlay in black and white.

2.3 Switching on - Test set up

For the purpose of this section it is assumed that the following four connections have been made:-

- Genlock to Amiga
- Genlock to your monitor (RGBa)
- Video Out to a composite monitor
- Video In from an off-air signal (for example, a VCR tuned to your local station)
- no mode selection (default)

Once Genlock has been connected to the Amiga system and the other connections have been made to the input and output connectors, the Amiga can be switched on.

Note for A1000 users.
Until Kickstart has been loaded you may see two separate displays on your screen that are not yet locked and appear to be floating about on top of each other. This is quite normal and will only last for a few seconds until Kickstart has loaded and the Workbench Icon appears.

If you follow your normal start up procedures then your machine will respond normally from the point where Kickstart has been fully loaded.

2.4 Switching on the video source

If the video source is switched on at this point then you will see that the background colour has been replaced with the external video signal.

2.5 Genlock Video Switch

Your Amiga can function in both medium and high resolution modes. In medium resolution mode 32 colours can be displayed on the screen at the same time. The 32 colours displayed are those described by the contents of colour registers 0 to 31. Similarly in high resolution mode 16 colours are used, represented by colour registers 0 to 15. The background colour is always described by the contents of register 0.

You can change the background colour by using the Preferences Window, accessible through the Amiga Workbench.

Genlock's high speed video switch switches to external video when the background colour is displayed. Therefore what you are now seeing can be described as the background colour becoming transparent.

Please be aware that, in background mode, if you are displaying a foreground colour that is the same colour as the background it will not become transparent. It is only when register 0 is active that video is switched through.

2.6 Interlacing

Most external video sources will be interlaced.

If you use your Amiga in interlaced mode please be aware that, when Genlock is fitted, it will only operate in interlaced mode if it is supplied with an interlaced input signal.

2.7 Running Genlock with control software

Mode Options

Your Genlock will function satisfactorily without requiring you to load the control software on the 3.5" disk which is included in this package. The system operates on the video input signals and your Amiga's RGB output signals. To keep the two signals in step at all times the Amiga's video sync is provided by Genlock. No processor time is required for Genlock to function.

2.8 Background mode

When you use your Genlock without it's software, it automatically defaults to background mode, in which the background colour becomes transparent and displays the external video signal as described above.

There are three additional operational modes which can be accessed using the control software supplied with your Genlock.

2.9 Video only mode

This mode lets you view only the External Video display coming into the Genlock via the CVBS input connector.

2.10 Amiga only mode

This mode lets you view your Amiga display as you would without the Genlock installed. If input video signal is present then the output will conform to PAL standards.

2.11 Foreground mode

In this mode Black is the transparent colour. Any colour that meets the requirements becomes transparent. This can include any of the colours specified by registers 0 through 31. Unlike other modes, foreground mode has 2 options, called Foreground Mode 1 and Foreground Mode 2 which are explained in the Mode Control section.

To make use of this software you will need to make a Mode Control Cable as described in the next section.

2.12 Connecting the Mode Control Lines

The following instructions will tell you how to construct a Mode Control Cable. This Cable will attach to your Amiga and allow you to make use of the control software which came with your Genlock. The instructions assume you are familiar with basic soldering techniques. If you are not comfortable with soldering you may wish to have someone more experienced build this for you.

2.13 Tools you will need

Female 23 Pin 'D'	- supplied
Male 25 Pin 'D'	- for Amiga 500/2000
Female 25 Pin 'D'	- for Amiga 1000
Connector hood for the 25 Pin 'D'	
12" length of 4 core cable	- colour coded

You will also need a soldering iron, some solder and some small hand tools.

1. Locate the 23 Pin 'D' socket supplied with your Genlock. It was fitted to the Amiga video output port on the Genlock. See RGB connector on page 6.

2. Locate and disassemble the 25 Pin 'D' plug/socket for connection to the Amiga parallel port. Take notice of how this is disassembled so that you can assemble it later on.

3. Take the length of cable and strip both ends to make it suitable for connecting to the 'D' connectors.

4. Take the 23 Pin 'D' and solder one wire to each of the pins 9,11 and 12. These are clearly marked in the plastic surrounding the pins. Note the colour of each of the wires going to each of the pins. We suggest that you write down the information to avoid confusion later. Please note: One of the four wires is not connected and should be clipped back to avoid shorting.

5. Take the 23 Pin 'D' and solder one wire to each of the pins 9, 11 and 12. These are clearly marked in the plastic surrounding the pins. Solder the wire

connected to pin 9 on the 23 way 'D' to pin 4 on the 25 way 'D'. Solder the wire to pin 11 on the 23 way 'D' to pin 3 on the 25 way 'D'. Solder the wire connected to the pin 12 on the 23 way 'D' to pin 2 on the 25 way 'D'.

6. Enclose the 25 way 'D' in it's hood. Be sure to tighten all the screws holding the case and the cable. This will prevent any accidental stress on the cable and prevent any wires becoming shorted or open circuit.

7. If you have access to an Ohm meter, you might wish to check the cable for any shorted or open connections.

8. With your Amiga turned off, locate the Parallel Port at the back of your Amiga. Remove any cables and plug in the 25 way end of your newly assembled cable. Next plug in the 23 way end of your cable into the Genlock.

Your Genlock is now ready for software control.

2.14 Running Rendale Control Software

The Rendale Genlock software comes in two versions GenCon1 and GenCon2. Gencon1 uses the Amiga function keys to control the modes, while GenCon2 lets you use Control Key combinations. If you are multitasking with other software which uses the function keys, then GenCon2 should still allow you to use Genlocks software control modes.

Before you use the Rendale control software, we strongly recommend that you make up a backup copy of this disk and only use the back up copy.

To use the Rendale control software simply double click on the Rendale Genlock Control icon with the mouse. Alternatively, you can type GenCon1 (GenCon2) into the CLI and press return. A window will pop up to let you know that the software has been installed successfully.

After the software has been installed, you can control Genlock using the function keys F1, F2, F3 and F4 when running GenCon1 (or by pressing CNRL-1, 2, 3 or 4 when running GenCon2). For the purposes of this manual, we will use brackets to describe these key settings: [1], [2], [3] and [4]. Think of these as toggle switches, each with two states: ON and OFF or 1 and 0. So if [1] and [2], for example, were both toggled off, then we would call this condition (0,0).

When you first start your system, Genlock comes up in the default or Background Mode. Loading the Rendale Genlock software does not alter this. Switches [1] and [2] are both on.

Switches [1] and [2] determine which mode the Genlock is in. (Switch [3] is used in conjunction with Foreground Mode only and will be explained later). Switch [4] can be considered a Reset switch, returning the three mode control switches to their on state.

Background mode requires a state of (1,1). Both switches [1] and [2] must be on. This is the default setting. If you alter this and want to return to the default mode as a point of reference, press [4]. This will reset all the switches to the ON state, or the 1 state.

With Genlock in the Background mode (1,1), press [1]. This will place the Genlock in Video Only Mode with a switch setting of (0,1). Press [1] again to return the switches to (1,1) or background mode. Pressing [2] will activate Amiga Only Mode with a setting of (1,0). Pressing [1] again will place the Genlock in Foreground Mode with a switch setting of (0,0).

When you activated Foreground Mode, you may not have noticed any difference between Foreground Mode and Amiga only mode. Pressing [3] will now have an effect. Call the modes toggled by [3] Foreground Mode 1 and Foreground Mode 2.

Whilst the first three modes are self-explanatory, the two Foreground options need some elaboration. Instead of switching upon seeing colour 0, the Genlock switches upon seeing black regardless of whether that colour is colour 0 or not. Although RGBa defines Black as a colour with values (0,0,0), Foreground Mode defines black as any colour with red, green and blue values less than 7. These colours become transparent at every other value of blue between 0 and 7. The only difference between Foreground Modes 1 and 2 is that colours that are less than (7,7,7) that become transparent in Foreground 1 will become solid in Foreground 2 Mode (and vice versa).

> Note: To see the effect of this, use Preferences and set Red and Green (for any workbench colour) below the 50% mark and then change the Blue slider through the full range and observe the results. The incoming video will become transparent on alternate steps as the Blue slider is moved from zero upwards until the 50% mark is reached.

The addition of the [3] switch gives us five effective modes. They are as follows:-

	Mode	F1	F2	F3
A.	Background Mode	1	1	1
B.	Video Only Mode	0	1	1
C.	Amiga Only Mode	1	0	1
D.	Foreground Mode 1	0	0	1
E.	Foreground Mode 2	0	0	0

2.15 Running Genlock with Software

Once the Amiga system has been turned on and 'Kickstart' is loaded then the A8802 Genlock is operational.

The system operates on the video input signals and Amiga's RGBa output signals. To keep the two signals in step, at all times, the Amiga clock is supplied by the Genlock. No processor time or additional software is required to run the A8802.

Overlays, animation and captions can be generated using existing software packages. Load and run these packages in the normal way, with Genlock connected, to obtain a composite display of both the incoming video and the Amiga overlay.

2.16 Notes on Video

Perhaps you have spent extensive hours viewing graphics on a full bandwidth RGBa monitor. This note is intended to caution you that video encoding, no matter how rigorously executed, will cause some degree of picture degradation. The process of encoding involves some bandwidth reduction, which means loss of high frequency detail, and it creates the possibility of spurious picture patterns, especially on sharp edges due to coding system limitations.

Further complications can arise with the use of domestic video recorders. These devices have reduced bandwidth on recording and playback. Further loss of high frequency detail may be noticed on recorded material. Cross-colour may also be aggravated on playback due to the loss of chroma/horizontal synchronization, which is normal for domestic video recorders. Cross-colour is seen as a rainbow pattern effect mainly on fast luminance edges such as vertical lines.

With careful design of Graphics many of these problems can be minimised.

Using VCR

When using VCR as an input there are several points that need to be considered:-

1. Most monitors have a VCR - A/V button. On the A1081/A1084 monitor this is located at the rear of the unit (refer to the A1081/A1084 User Manual). VCR mode should be selected to ensure correct operation with a VCR input.

2. The stability of the graphics and the quality of the colour produced depends, to a large extent, on the quality of the incoming Video signal. The A8802 is designed to track an incoming video source such as VCR, however it should be noted that the VCR's do fluctuate when tracking tape. This and other factors such as poor quality tape, tape stretching, worn and dirty heads or tape drive assemblies can cause stability and colour problems.

3. When using VCR as an input device please ensure that in STOP MODE a suitable video signal is produced. It is normal for a VCR to switch to an off air signal when the stop button is activated. If the unit is not connected to an aerial when the button is pressed then it may output 'noise'. If Genlock sees this 'noise' as an input signal it will try and lock to it without success. The results will be a very unstable RGBa screen and/or a composite screen which is black with a large number of random white spots. This can be avoided by ensuring that the VCR is set up to line input/camera input/baseband recording etc.. See each recorders instruction manual for details.

4. Some video recorders have 'features modes', such as still frame and picture search mode. When operating in these modes some VCR's will produce non-standard synchronizing signals and the Genlock may not be able to maintain lock.

5. When using a domestic VCR to record the CVBS output signal from the system, you should be aware that due to the bandwidth restrictions of most home machines there will be a loss of detail (high frequency information). This can usually be compensated for by careful graphics design.

6. Most T.V.'s and low resolution monitors are not capable of resolving more than 320 dots per inch. Do not expect to see the same quality picture on your T.V. as that displayed on the Amiga monitor.

3.0 In case of difficulty

Should the system not respond as you would expect it to the following points may prove useful.

1. Always check your connections.

2. Always check your signals.

3. Start from basics:-
   a. Disconnect all but the Amiga and the Genlock. Switch on and check using the RGBa monitor.
   b. Add the composite monitor. Switch on and check.
   c. Add an input signal. (if necessary check the input signal by plugging it directly into the monitor first).
   d. Add other units one at a time until you have a working system or you have found the cause of the problem.
   e. If alternative video sources, monitors, cables etc. are available - try them.

3.1 Warranty/Service/Support

Any claim under warranty or request for servicing should be made through the supplier of the unit.

The invoice from the supplier is proof of date of purchase. This must be produced when returning any item for repair under warranty.

Rendale Ltd. liability is limited solely to the repair or replacement of the defective product, in its sole discretion, and shall not in any event include damages for loss of use of anticipated costs, expenses or damages including, without any limitation, any data or information which may be lost or rendered inaccurate, even if Rendale Ltd. has been advised of the possibility of such damages.

Rendale Ltd. shall not have any obligation to enhance or update any produce after manufacture.

Servicing: Returning the unit.

One year parts and labour - free of charge.

Post and packing at the users cost.

Proof of posting is not proof of delivery, therefore all goods returned for servicing must be sent by a method where proof of delivery can be obtained.

Returned units must be suitably packed to ensure safe transit.

Support

Engineering service and support should be available from your supplier. If you have any technical problems or require further information or supplies please write, where possible, or telephone one of the numbers listed below.

Rendale
62 Tenter Road
Moulton Park Business Centre
Northampton
NN3 1PZ

(0604) 790466

4.0 Getting Technical

Ports and Connections

4.1 A8802 to the Amiga Video Port

This is the 23 way ribbon cable assembly for direct connection to the Amiga computer. It carries all the video, clock and power connections between the two units.

WARNING:
ALWAYS ENSURE THAT THE AMIGA IS SWITCHED OFF WHILE EITHER CONNECTING OR DISCONNECTING THE RIBBON CABLE FROM THE A8802 TO THE AMIGA COMPUTER.

4.2 CVBS Input

This is a 75R BNC socket for composite video or black and burst input. The signal is terminated @ 75R. Suitable inputs should conform to PAL CCIR specifications for correct operation. The input level should be 1v p-p when terminated. Suitable inputs can normally be found on Cameras, Laser Disks, VCR's, Tuner Units etc.. Reference to the manufacturers specifications for the equipment you wish to connect should supply the information you need.

Note:
If the input signal from the external source is black and white (no colour burst) or if the colour burst is less than 50mv p-p then the output video signal will be monochrome (black and white).

4.3 CVBS Output

This is a 1v p-p composite signal when terminated into 75R. The output will consist of the external video signal overlaid with the Amiga graphics as defined by the mode control lines. If no input signal is present then the output will consist of the encoded Amiga graphics screen.

If you require a correctly timed PAL signal Amiga graphics, then a good quality external reference signal must be provided. This signal can best be obtained from an SPG or an off air signal (a tuner set to receive a local broadcast station), and select Amiga display only. (See Mode Select).

The stability of the output is dependent on the input signal quality.

4.4 Auxiliary Connector

This is a 23 way 'D' connector which carries Amiga generated RGBa video for direct connection to the original Amiga monitor cable. It also carries the mode selection input and some reserved expansion connections.

RGBa Pass Through. When connected to the Amiga monitor the screen will show the Amiga graphics being generated. This is useful for either previewing graphics or using the machine in the normal manner.
The RGBa connections may also be used for external RGB mixing or where broadcast coders are required. The outputs are full Amiga bandwidth signals at 0.7v p-p when terminated @ 75R.

The composite sync output from this connector is switched to regenerated input sync when an input signal is present, this is a negative going sync at TTL levels and it will also drive 0.3v p-p into 75R. Changeover from Amiga composite sync to external composite sync is automatic.

23 PIN AUXILIARY CONNECTOR

The original RGBa Video Lead can be connected to this connector to show and preview the Amiga graphics.

Connections:-

Pin Number		Comments
1.	Reserved	(Do not use)
2.	N/C	
3.	REDa	0.7V p-p Z_o = 75ohm
4.	GREENa	0.7V p-p Z_o = 75ohm
5.	BLUEa	0.7V p-p Z_o = 75ohm
6.	N/C	
7.	N/C	
8.	N/C	
9.	Mode Bit 1	(TTL Input)
10.	Sync	(Neg - TTL Output)
11.	Mode Bit 0	(TTL Input)
12.	Mode Bit 1	(TTL Input)
13-23.	Ground	

4.5 Mode Control

Bits				
	0	1		
	1	1	=	Background (Default Mode)
	1	0	=	External Video Only
	0	1	=	Amiga Video Only
	0	0	=	Foreground Mode (Mode Bit 1 becomes active).

Mode Selection

The A8802 has four modes. These modes affect the way that the unit overlays graphics onto the incoming signal. The Amiga remains Genlocked to the external signal irrespective of the mode selected. With no input defaults to show Amiga graphics. See Mode selection for switching details.

Mode 1 - Default
With no mode selection made the unit operates by replacing the Amiga background (Amiga colour register 0 as described earlier) with the incoming video signal.

N.B. If your input is Black and Burst then the default mode will show a black background.

Best results are obtained in background mode when the background is Black. i.e. Always set the background to black to avoid colour fringing and to agree with professional standards.

Mode 2
This mode will display Amiga graphics only. The Amiga graphics are overlaid onto external sync to provide a correctly timed graphics signal. The input can be either Black and Burst or a composite video signal.

Mode 3
In this mode the external video signal is switched directly to the output. No graphics are visible on the composite monitor. This is useful when two screens are being used, one for the final output and the second (via the RGBa auxiliary connector) is used to preview the Amiga graphics for overlay at the correct time by switching to another mode.

Mode 4
In this mode transparent windows can be created in graphics. Transparency occurs when the RGBI signal is black*. This can be used to advantage, for example, to produce wipes and windows - to cover and uncover parts or all of the incoming video picture. The transparent mode is effective on both the foreground graphics and background graphics.

In foreground mode the Amiga graphics become transparent and show the CVBS input (incoming video signal) when the Amiga Graphic Colour RGBI = 0 i.e. Black.
Note: Due to the Amiga decoding of RGBI the I bit is true for every other setting of LSB Blue.

To see the effect of this use preferences and set Red and Green below the 50% mark and then change the Blue slider through the full range and observe the results. The incoming Video will become transparent on alternate steps.
The black transparent colour can be controlled by using the Mode Bit I control line. This line will control which of the black colours become transparent in the foreground mode.

Mode control can be activated in several ways.

1. With no connection the internal pull up resisters select Mode 1. This is background mode (default mode).

2. To select the other modes of operation the mode select pins should be connected to ground as required.

   Options include:

   a. Wire link(s) on the 23 way connector provided to ground the required control pin(s).

   b. Connection to external switches using the mode control pins and the ground pins on the 23 way connector. This method allows the required mode to be preset as required.

   c. Connection to an external control device. The control device must be TTL compatible.

   d. Connection to the Amiga parallel port so that the unit can be controlled by software.

5.0 Test and Adjustments

Your Genlock has been shipped to you fully setup and adjusted to operate correctly with your Amiga. However should you need to adjust your Genlock the following adjustment procedure may prove useful.

Should you suspect a problem with your Genlock, please try to establish that it is indeed the Genlock that is not operating correctly before attempting these adjust-

ments. An unstable video signal supplied as an input to Genlock will cause an unstable output. See section 4 'In Case of Difficulty' for more information.

Only after you have established beyond a doubt that the Genlock needs adjusting, then you will need the following equipment before proceeding with the adjustment section. This equipment is standard television studio signal monitoring equipment. If you do not have access to this equipment do not attempt to adjust your Genlock. Please read the section on warranty of the Genlock. If your efforts result in a hopelessly mal-adjusted unit, Rendale will restore the unit to the correct calibration for a charge of 25 U.K. Pounds plus any overseas postage charges.

Equipment needed:

1. PAL Colour Bar Generator - Studio Quality
2. Vector Scope
3. Waveform Monitor
4. Frequency Meter
5. Oscilloscope - with high impedance input (10Mohm)
6. PAL Composite Monitor. Preferably with underscan
7. RGBa Monitor. Preferably with underscan
8. An Amiga Computer - A1000, A500, A2000 or B2000
9. 23 Way connector with pins 9, 11 and 12 taken to ground
10. Shorting Link

Adjusting Procedures

> Warning. Do not undertake these procedures unless you understand the problems inherent in working on static-sensitive components and how to overcome them. It is possible to damage the Genlock with static discharges during these adjustments.

We suggest that you mark the position of all adjustable components before attempting to readjust the Genlock. This will enable you to reset them to the original setting if required.

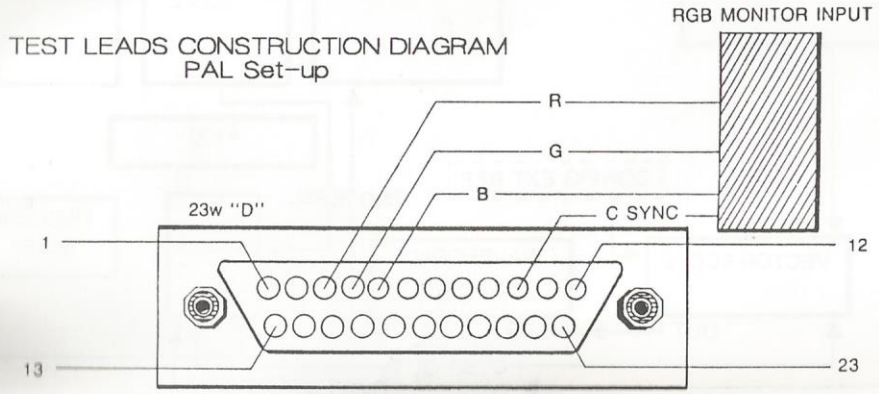
1. Connect the unit to be tested to an Amiga Computer.
2. Connect the video input and output to the equipment as shown in the diagram.
3. Turn on your computer to the point where it shows the 'Workbench' Icon.

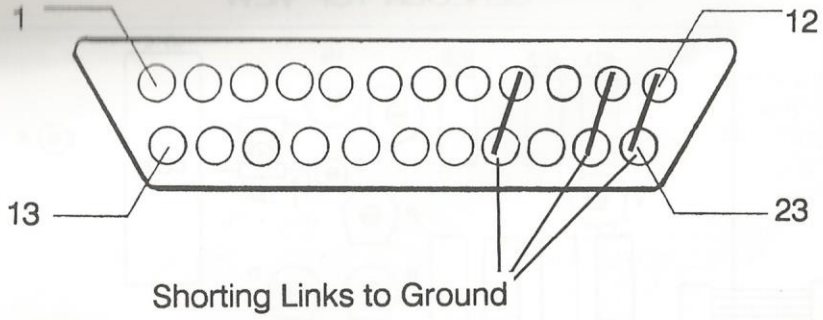
The following adjustments are shown in the order that they must be carried out. Some of the controls are interactive and therefore affect later adjustments. The procedures

are therefore listed in the order that minimises these effects.

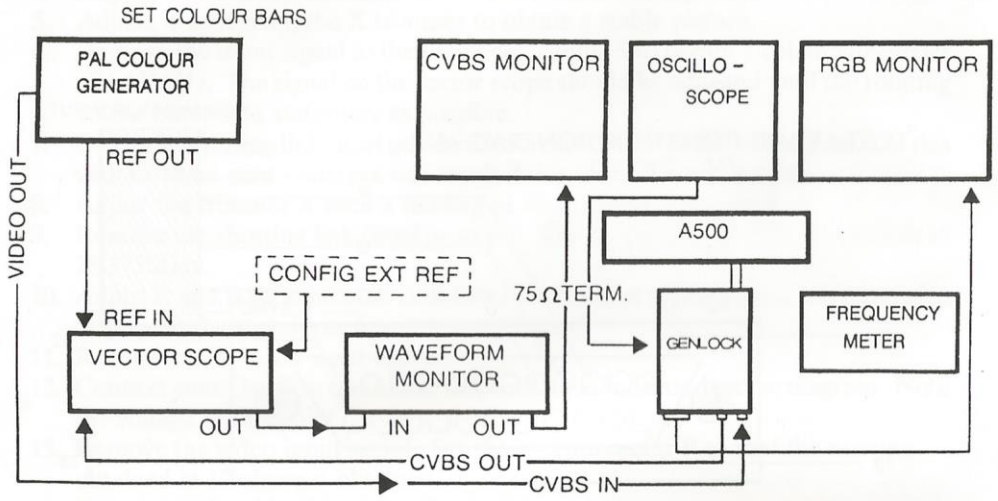
4. Adjust, if necessary, the Hs trimmer to obtain a stable picture.
5. Adjust, if necessary, the X trimmer to obtain a stable picture.
6. Remove the input signal to the Genlock. Adjust S to obtain a colour subcarrier of 4.43MHz. The signal on the vector scope should be adjusted until the rotating colour burst is as stationary as possible.
7. Using the shorting link short out the 220R resistor shown on the diagram. Do this with extreme care - damage can result if this is not done carefully.
8. Adjust the trimmer X until a reading of 28.375MHz is obtained.
9. Remove the shorting link fitted in step 7. The frequency meter will now lock to 28.375MHz.
10. Adjust R and B for minimum subcarrier modulation at black level. An expanded display on the waveform monitor is suggested.
11. Reconnect the video input signal.
12. Connect your Oscilloscope to the 18K resistor as indicated on the diagram. Note the voltage at this point.
13. Remove the video input signal. Set the potentiometer P so that the reading obtained in 12 above is obtained.
14. Reconnect the video input signal.
15. Fit the 23 way connector to the RGBa output of the Genlock.
16. Adjust H to obtain correct line blanking on the back porch. If you adjust H carefully clockwise you will see that the right hand edge of the screen 'creeps' in. Adjust this until the 'edge' is just off screen. Adjustment on the waveform monitor should be made so that blanking is set to just after the valid picture time.
17. Adjust V to obtain frame blanking three lines before end of picture. If V is adjusted clockwise a point will be reached where a stable picture is obtained. At the bottom of the picture you will be able to see the input colour bars. V should be adjusted until the last three lines of the external video (picture detail) are visible.
18. Remove the 23 way connector and reconnect the RGBa Screen.
19. Boot the Amiga Workbench to obtain a normal workbench screen.
20. Adjust Hs to obtain minimum jitter on the top 'drag bar'.
21. Check out the following functions:-
    a. without an input signal the displays show the Amiga display.
    b. with an input signal the composite display shows mixed external video and Amiga graphics, the RGBa screen shows only Amiga graphics.
    c. with the 23 way shorting plug fitted any black on the Amiga display is transparent.

Repeat this procedure if problems persist. If the unit is not responding correctly please refer to the section on service.

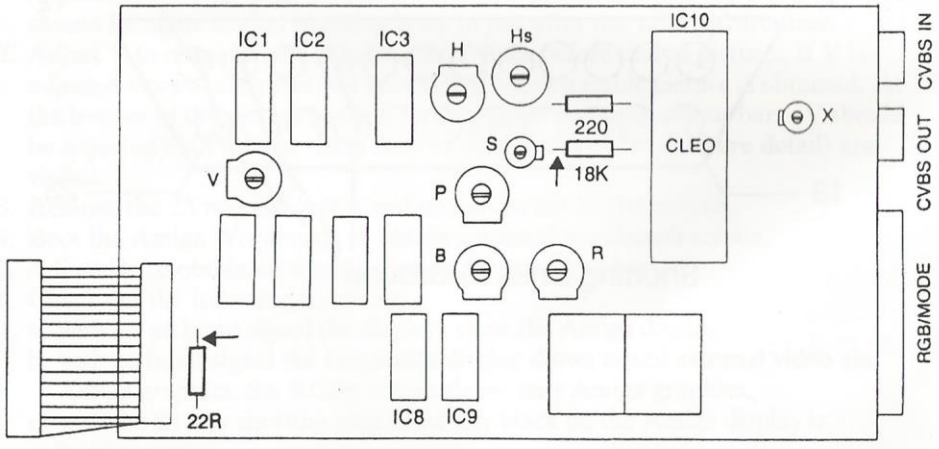




TEST EQUIPMENT SET-UP DIAGRAM



GENLOCK TOP VIEW



Amiga Video Port-to-GENLOCK ribbon cable